

Claims

Claim 1. A process for separation of components of a gaseous or a liquid feed stream comprising

passing the components of the gaseous or liquid feed stream over a molecular sieve adsorbent blend produced by a process comprising

preparing a zeolite product;

preparing an attapulgite binder comprising highly dispersed attapulgite fibers;

mixing the zeolite with the attapulgite binder and water to produce a mixture; and

forming a molecular sieve adsorbent product from the mixture;

wherein the tapped bulk density of the highly dispersed attapulgite fibers, as measured according DIN/ISO 787, is more than about 550 g/l.

Claim 2. A process for drying a gaseous feed stream comprising passing the feed stream over a molecular sieve adsorbent blend product comprising a zeolite blended with a highly dispersed attapulgite binder, wherein the tapped bulk density of the highly dispersed attapulgite binder is more than about 550 g/l.

Claim 3. A process for adsorption of carbon dioxide from an air stream comprising

passing the air stream over a molecular sieve

adsorbent blend product produced by a process comprising

preparing a zeolite product;

preparing an attapulgite binder comprising highly dispersed attapulgite fibers;

5 mixing the zeolite with the attapulgite binder and water to produce a mixture; and

forming a molecular sieve adsorbent product from the mixture;

10 wherein the tapped bulk density of the highly dispersed attapulgite fibers, as measured according DIN/ISO 787, is more than about 550 g/l.

Claim 4. A process for removal of water from a gaseous or liquid ethanol stream comprising passing the gaseous or liquid ethanol stream over a molecular sieve adsorbent blend
15 produced by a process comprising

preparing a zeolite product;

preparing an attapulgite binder comprising highly dispersed attapulgite fibers;

20 mixing the zeolite with the attapulgite binder and water to produce a mixture; and

forming a molecular sieve adsorbent product from the mixture;

25 wherein the tapped bulk density of the highly dispersed attapulgite fibers, as measured according DIN/ISO 787, is more than about 550 g/l.

Claim 5. A process for separation of nitrogen and oxygen from an air stream comprising passing the air stream over a molecular sieve adsorbent blend produced by a process comprising

5 preparing a zeolite product;
 preparing an attapulgite binder comprising highly dispersed attapulgite fibers;

 mixing the zeolite with the attapulgite binder and water to produce a mixture; and

10 forming a molecular sieve adsorbent product from the mixture;

 wherein the tapped bulk density of the highly dispersed attapulgite fibers, as measured according DIN/ISO 787, is more than about 550 g/l.

15 Claim 6. A process for removal of sulfur and oxygen containing compounds from a hydrocarbon stream comprising passing the hydrocarbon stream over a molecular sieve adsorbent blend product by a process comprising

 preparing a zeolite product;
20 preparing an attapulgite binder comprising highly dispersed attapulgite fibers;

 mixing the zeolite with the attapulgite binder and water to produce a mixture; and

 forming a molecular sieve adsorbent product from
25 the mixture;

wherein the tapped bulk density of the highly dispersed attapulgite fibers, as measured according DIN/ISO 787, is more than about 550 g/l.

Claim 7. A process for removal of carbon monoxide, carbon dioxide and nitrogen from a hydrogen gas stream comprising passing the hydrogen gas stream over a molecular sieve adsorbent blend produced by a process comprising

preparing a zeolite product;

preparing an attapulgite binder comprising highly dispersed attapulgite fibers;

mixing the zeolite with the attapulgite binder and water to produce a mixture; and

forming a molecular sieve adsorbent product from the mixture;

wherein the tapped bulk density of the highly dispersed attapulgite fibers, as measured according DIN/ISO 787, is more than about 550 g/l.

Claim 8. A process for removal of water from a gaseous or liquid hydrocarbon stream comprising passing the gaseous or liquid hydrocarbon stream over a molecular sieve adsorbent blend produced by a process comprising

preparing a zeolite product;

preparing an attapulgite binder comprising highly dispersed attapulgite fibers;

mixing the zeolite with the attapulgite binder and

water to produce a mixture; and

forming a molecular sieve adsorbent product from the mixture;

wherein the tapped bulk density of the highly dispersed attapulgite fibers, as measured according DIN/ISO 787, is more than about 550 g/l.

Claim 9. A process to separate n-paraffins from a mixture of iso-paraffins and n-paraffins comprising passing the mixture over a molecular sieve adsorbent blend produced by a process comprising

preparing a zeolite product;

preparing an attapulgite binder comprising highly dispersed attapulgite fibers;

mixing the zeolite with the attapulgite binder and water to produce a mixture; and

forming a molecular sieve adsorbent product from the mixture;

wherein the tapped bulk density of the highly dispersed attapulgite fibers, as measured according DIN/ISO 787, is more than about 550 g/l.

Claim 10. A process for removal of water from a gaseous or liquid stream of refrigerants comprising passing the gaseous or liquid stream over a molecular sieve adsorbent blend produced by a process comprising

preparing a zeolite product;

preparing an attapulgite binder comprising highly dispersed attapulgite fibers;

mixing the zeolite with the attapulgite binder and water to produce a mixture; and

5 forming a molecular sieve adsorbent product from the mixture;

 wherein the tapped bulk density of the highly dispersed attapulgite fibers, as measured according DIN/ISO 787, is more than about 550 g/l.

10 Claim 11. A process for removal of water and carbon dioxide from air comprising passing the air over a molecular sieve adsorbent blend produced by a process comprising

 preparing a zeolite product;

15 preparing an attapulgite binder comprising highly dispersed attapulgite fibers;

 mixing the zeolite with the attapulgite binder and water to produce a mixture; and

 forming a molecular sieve adsorbent product from the mixture;

20 wherein the tapped bulk density of the highly dispersed attapulgite fibers, as measured according DIN/ISO 787, is more than about 550 g/l.

 Claim 12. The process of Claim 1 wherein the zeolite product comprises zeolite X or zeolite A.

25 Claim 13. The process of Claim 2 wherein the zeolite

product comprises zeolite X.

Claim 14. The process of Claim 3 wherein the zeolite product comprises zeolite X or zeolite Y.

5 Claim 15. The process of Claim 9 wherein the zeolite product comprises zeolite A.

Claim 16. The process of Claim 11 wherein the zeolite product comprises zeolite X or zeolite Y.

10 Claim 17. The process of Claim 1 wherein the attapulgite binder comprises from about 5 to about 30 percent of the mixture, by weight.

Claim 18. The process of Claim 1 wherein the attapulgite binder comprises from about 5 to about 20 percent of the mixture, by weight.